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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/522,340

08/12/2005

Jean-Marc Suau

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02/28/2008

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
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ALEXANDRIA, VA 22314

EXAMINER

BERNSHTEYN, MICHAEL

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

02/28/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/522,340	Applicant(s) SUAU ET AL.	
	Examiner MICHAEL M. BERNSHTEYN	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-8 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Office Action follows a response filed on December 19, 2006. Claims 1, 3 and 8 have been amended; claim 2 has been cancelled; no claims have been added.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 19, 2007 has been entered.

3. In view of the amendment(s) and remarks the objection of the specification and the rejection of claims 1 and 3-8 under 35 U.S.C. § 103(a) as being unpatentable over J. Chiefair et al. (WO 99/31144) in view of Egraz et al. (U. S. Patent 6,063,884) has been withdrawn.

4. Applicant's arguments with respect to claims 1 and 3-8 have been considered but are moot in view of the new ground(s) of rejection.

5. Claims 1 and 3-8 are pending.

Claim Objections

6. Claim 8 is objected to because of the following informalities: improper Markush group format. According MPEP § 2171.05(h), one acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as

being “selected **from the group consisting** of A, B and C.” See *Ex parte Markush*, 1925 C.D. 126 (Comm’r Pat. 1925). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites, “...sulphate methacrylate, as well as their acrylate or acrylamide counterparts, whether quaternised or not...” It is not clear which exactly compounds could be used as counterparts and what is a difference in use of quaternised or not quaternised compounds?

Claim Rejections - 35 USC § 103

8. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

9. Claims 1 and 3-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over J. Chiefair et al. (WO 99/31144) in view of John T. Lai et al. (" Functional Polymers from Novel Carboxyl-Terminated Trithiocarbonates as Highly Efficient RAFT Agents", *Macromolecules* 2002, Vol. 35, No. 18, p. 6754-6756).

With regard to the limitations of instant claims 1, 3, 4 and 6-8, Chiefair discloses a free radical polymerization process for synthesizing polymers. The process utilizes sulfur based chain transfer agents and is widely compatible over a range of monomers and reaction conditions. The process produces novel polymers having low polydispersity and predictable specific polymer architecture and molecular weight. The polymers are suitable for use as binders in automobile OEM and refinish coating (abstract).

The process is in batch or semi-batch mode and comprises two stages, the first of which is synthesizing "in situ" a hydrosoluble transfer agent used in the second stage of polymerization (page 7, lines 23-25; page 26, lines 20-22; examples, page 34-64).

Chiefair discloses that a monomer mix suitable for use may include at least one vinyl monomer of the formula (31) below:



where L is selected from the group consisting of hydrogen, halogen, and substituted or unsubstituted C₁-C₄ alkyl substituents being independently selected from the group consisting of OH, OR", CO₂H, O₂CR", CO₂R" and a combination thereof;

where M is selected from the group consisting of hydrogen, R", CO₂R", COR", CN, CONH₂, CONHR", CONR"₂, O₂CR", OR", and halogen.

R" is selected from the group consisting of substituted or unsubstituted alkyl, alkenyl, aryl, heterocyclyl, aralkyl, alkaryl, and a combination thereof (page 13, lines 5-8, page 19, lines 18-28).

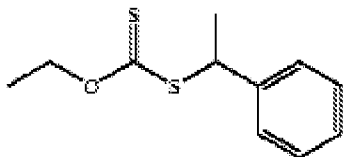
Depending upon the type of polymer desired, the monomer mix may also include the following monomers: maleic anhydride, N-alkylmaleimide, N-arylmaleimide, dialkyl fumarate, cyclopolymerizable or ring opening monomer, or a combination thereof. The monomer mix may also include macromonomers, which are compounds of the formula (31) where L or M is a polymer chain.

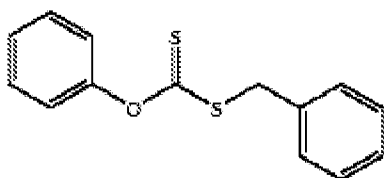
The monomers or comonomers of the formula (31) generally include one or more of acrylate and methacrylate esters, **acrylic and methacrylic acids**, styrene, acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, vinyl esters and mixtures of these monomers, and mixtures of these monomers with other monomers (page 19, line 35 through page 20, line 3).

Chiefair discloses that one of the significant advantages of the process is that the low polydispersity of the polymer in the range of 1.05 to 1.3 can be maintained even at high monomer conversions in the range from 10% to 100% (page 24, lines 3-6).

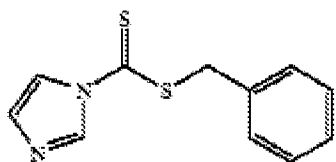
Chiefair discloses a lot of chain transfer agents, which are substantially identical to the claimed invention. Some of them were exemplified by the Applicant, such as compound C (example 1, test 2, pages 15-16, [0185]); compound F (example 1, test 4, page 16, [0193]); compounds M, N and P (example 1, test 7, [0206]).

Compound C

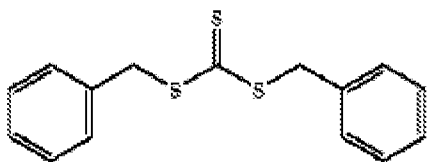




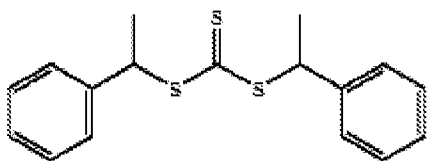
Compound F



Compound M



Compound N



Compound P

Chiefair discloses that the amount of chain transfer agents, index polydispersity and molecular weight of the obtained polymers are within the claimed ranges in the most examples (examples 15-52, pages 45-62).

The reactive media of the first stage of synthesis of the transfer agent include water (Procedure 1, page 35, line 32; example 2, page 36, lines 13-14, etc.).

Chiefair does not disclose that the reactive media of the first stage of the chain transfer agent and of the second stage of polymerization is water.

John T. Lai discloses that the trithiocarbonates have extremely high chain-transfer efficiency and control over the radical polymerization because the carbon attached to the labile sulfur atom is tertiary and bears a radical-stabilizing carboxyl

group. Telechelic carboxyl-terminated polymers are easily obtained when dicarboxyl trithiocarbonate is employed. Bulk or solution polymerizations of alkyl acrylates, acrylic acid, and styrene are well-controlled. Well-defined block copolymers can also be synthesized (p. 6754, 1st column). It has found that **most common solvents** would work with the controlled polymerization, tert-butyl alcohol, acetone, methyl ethyl ketone, toluene, xylene, **water (for acrylic acid)**, and DMF are all suitable solvents. Bulk polymerizations are also successful. The polydispersity is usually close to 1.1, when the monomers are alkyl **acrylates**, **acrylic acid**, and styrene. Block copolymers are easily made by polymerizing the first monomer, removing residual monomers if less than 95% converted, followed by chain extension with the second monomer (p. 6754, 2nd column).

Both references are analogous art because they are from the same field of endeavor concerning new process for polymerization of acrylic acid and its salts in the presence of a chain transfer agent.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate water as reactive media of **both stages** of polymerization as taught by John T. Lai in Chiefair's free radical polymerization process because John T. Lai successfully used water as **common solvent** in the processes of obtaining carboxyl-terminated trithiocarbonates as highly efficient chain transfer agents and polymerization of acrylic acid, and thus to arrive at the subject matter of instant claim 1 and dependent claims 3, 4 and 6-8.

With regard to the limitations of instant claim 5, Chiefair discloses that the molar ratio of transfer agent to monomer and mass ratio of transfer agent to monomer are within the claimed ranges (Examples 15-52, pages 45-64).

Response to Arguments

10. Applicants traverse double patenting rejection and the rejection under 35 U.S.C. § 103(a) of claims 1 and 3-8 as being unpatentable over Chiefair et al. (WO 99/31144 A1) in view Egraz et al. (U.S. Patent 6,063,884). Applicant's arguments have been fully considered but they are moot in view of new ground(s) of rejection.

11. In response to Applicants arguments that the chain transfer agents of Chiefair are not water soluble (page 7), and Chiefair uses organic solvents and not water as the sole solvent (pages 6-7), it is noted the following.

12. As to Applicants argument that the second difference between the polymerization process disclosed by Chiefair and that claimed by applicant is that the chain transfer agents of Chiefair are not water soluble, it is noted that the process can be carried out in emulsion, solution or suspension in either a batch, semi-batch, continues, or feed mode (page 26, lines 20-21). For solution polymerization, the polymerization medium can be chosen from a wide range of media to suit the monomer(s) being used (page 27, lines 7-8). It is worth to mention that the reactive media of the first stage of synthesis of the transfer agent include water (Procedure 1, page 35, line 32; example 2, page 36, lines 13-14, examples 10 and 11, page 41, etc.), and the amount of chain transfer agents,

index polydispersity and molecular weight of the obtained polymers are within the claimed ranges in the most examples (Examples 15-52, pages 45-62).

Chiefair clearly discloses that advantages of his invention are that it is suitable for the producing water born polymers that are water soluble or water dispersible, and it is suitable for producing solvent born polymers that are solvent soluble or solvent dispersible (page 8, lines 1-4).

Therefore, it is the examiner position that the chain transfer agents of Chiefair composition possess this property (e.g., they are water soluble). Since the USPTO does not have equipment to do the analytical test, the burden is now shifted to the applicant to prove otherwise. **In re Best** 195 USPQ 430, (CCPA 1977).

Even assuming that the claims are not anticipated by the reference, it would have been obvious to one of ordinary skill in the art to make the polymer using the claimed process because it appears that the reference generically embrace the claimed subject matter and the person of ordinary skill in the art would have expected all embodiments of the reference to work. Applicants have not demonstrated that the differences, if any, between the claimed subject matter and the subject matter of the prior art examples give rise to unexpected products.

13. As to Applicants arguments that Chiefair uses organic solvents and not water as the sole solvent (pages 6-7, it is noted that these arguments are moot in view of the new ground(s) of rejection (see paragraph 7 of current Office Action).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796

/Michael M. Bernshteyn/
Examiner, Art Unit 1796

/M. M. B./
Examiner, Art Unit 1796

John T. Lai et al., "Functional Polymers from Novel Carboxyl-Terminated Trithiocarbonates as Highly Efficient RAFT Agents", *Macromolecules* 2002, Vol. 35, No. 18, p. 6754-6756.

We have found that most common solvents would work with the controlled polymerization, *tert*-Butyl alcohol, acetone, methyl ethyl ketone, toluene, xylene, water (for acrylic acid), and DMF are all suitable solvents. Bulk polymerizations are also successful.

The polydispersity is usually close to I.I, when the monomers are alkyl acrylates, acrylic acid, and styrene. Block copolymers are easily made by polymerizing the first monomer, removing residual monomers if less than 95% converted, followed by chain extension with the second monomer (p. 6754, 2nd column).

These trithiocarbonates have extremely high chain-transfer efficiency and control over the radical polymerization because the carbon attached to the labile sulfur atom is tertiary and bears a radical-stabilizing carboxyl group. Telechelic carboxyl-terminated polymers are easily obtained when dicarboxyl trithiocarbonate is employed. Bulk or solution polymerizations of alkyl acrylates, acrylic acid, and styrene are well-controlled.

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Some disproportionation at chain ends are observed with methyl methacrylate. Well-defined block copolymers can also be synthesized (p. 6754, 1st column).